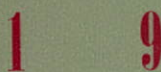


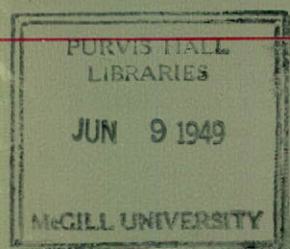
THIRTY-SIXTH

Annual Report



48

C O M P A N Y, L I M I T E D





BRAZILIAN TRACTION, LIGHT AND POWER COMPANY, LIMITED

ANNUAL ³⁶th REPORT

FOR THE YEAR ENDED DECEMBER 31ST, 1948

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BRAZILIAN TRACTION, LIGHT AND POWER COMPANY, LIMITED

(Incorporated under the Laws of the Dominion of Canada)

Board of Directors

HENRY BORDEN, C.M.G., K.C., Toronto, Canada	EDWARD HOLLAND-MARTIN, London, England
SIR ERIC GORE-BROWNE, D.S.O., O.B.E., London, England	BEVERLEY MATTHEWS, C.B.E., K.C., Toronto, Canada
E. G. BURTON, C.B.E., Toronto, Canada	JOHN PHILLIMORE, C.M.G., London, England
JAMES A. ECCLES, Montreal, Canada	W. E. PHILLIPS, C.B.E., D.S.O., M.C., LL.D., Toronto, Canada
E. C. FOX, Toronto, Canada	DR. EDGARD E. DE SOUZA, São Paulo, Brazil
G. BLAIR GORDON, Montreal, Canada	CLARANCE STANLEY, New York, U.S.A.
WALTER GOW, K.C., Toronto, Canada	H. B. STYLE, Rio de Janeiro, Brazil
S. H. LOGAN, Toronto, Canada	G. R. F. TROOP, C.A., Toronto, Canada
THE HON. MAURICE F. P. LUBBOCK, London, England	NORMAN D. WILSON, Toronto, Canada

Officers

President

HENRY BORDEN, C.M.G., K.C.

Vice-President

E. C. FOX

Vice-President (Administration)

ARNOLD GAINÉ

Secretary

OSBORNE MITCHELL

Vice-President and Treasurer

G. R. F. TROOP, C.A.

Assistant to the President

F. A. SCHULMAN

Principal Bankers

THE CANADIAN BANK OF COMMERCE

General Solicitors

BLAKE, ANGLIN, OSLER AND CASSELS,
TORONTO

Auditors

CLARKSON, GORDON & CO., TORONTO

Transfer Agents

NATIONAL TRUST COMPANY, LIMITED,
TORONTO AND MONTREAL

THE NATIONAL CITY BANK OF NEW YORK,
NEW YORK

Principal Operating Subsidiaries

THE RIO DE JANEIRO TRAMWAY, LIGHT & POWER COMPANY, LIMITED

THE SÃO PAULO TRAMWAY, LIGHT & POWER COMPANY, LIMITED

BRAZILIAN TELEPHONE COMPANY

BRAZILIAN HYDRO ELECTRIC COMPANY, LIMITED

SÃO PAULO ELECTRIC COMPANY, LIMITED

THE SAN PAULO GAS COMPANY, LIMITED

THE CITY OF SANTOS IMPROVEMENTS COMPANY, LIMITED

SOCIÉTÉ ANONYME DU GAZ DE RIO DE JANEIRO

COMPANHIA FERRO CARRIL DO JARDIM BOTANICO

Offices

HEAD OFFICE	- - - - -	25 King Street West, Toronto 1, Canada
LONDON AGENTS	- - - - -	Canadian-Brazilian Services Limited, 148, Leadenhall Street, London, E.C.3, England.

FOREWORD

BRAZILIAN TRACTION, LIGHT AND POWER COMPANY, LIMITED

is a Canadian corporation which through its Operating Companies has for upwards of 37 years been supplying electrical energy, gas and tramway service in the highly industrialized and progressive states of Rio de Janeiro and São Paulo and in the Federal District of Rio de Janeiro as well as telephone service in these centres, in the state of Minas Geraes and elsewhere in Brazil. These three states and the Federal District, situated in South-eastern Brazil, comprise an area of 342,000 square miles and have a population of approximately 20 millions. Included in this area are the cities of Rio de Janeiro, the capital city of Brazil, with a population of nearly 2 millions, São Paulo, the largest and most rapidly growing industrial centre in South America, with a population of approximately 1 $\frac{3}{4}$ millions, and Santos, one of Brazil's most important seaports.

Through its Operating Companies, Brazilian Traction, Light and Power Company, Limited produces and distributes approximately 65% of the total power produced in Brazil and supplies over 80% of the telephones in service in the country.

BRAZILIAN TRACTION, LIGHT AND POWER COMPANY, LIMITED

THIRTY-SIXTH ANNUAL REPORT

TO THE SHAREHOLDERS

YOUR directors submit herewith the following report on the Company's affairs, together with the audited financial statements for the year 1948 including the consolidated balance sheet of the Company and its operating subsidiary companies in Brazil as at 31st December, 1948. All figures in the report expressed in dollars are in United States currency unless otherwise indicated.

As may be seen from the information contained herein, the year 1948 has witnessed a further growth in the Company's services with the exception of transportation which shows a reduction due to the redrawing during the year of the bus operations in the city of Rio de Janeiro.

Comparative Statement of Earnings 1945-1948

The following statement shows the combined earnings and charges of the operating companies and of Brazilian Traction for the past four years, excluding inter-company items.

	1945	Year ended 31st December		
		1946	1947	1948
Gross earnings from operations - - - - -	\$65,150,899	\$78,253,700	\$92,578,431	\$101,945,202
Interest on temporary investments - - - - -	807,746	689,508	359,489	121,541
Other miscellaneous income - - - - -	221,733	117,673	144,388	111,824
Total Revenue - - - - -	\$66,180,378	\$79,060,881	\$93,082,308	\$102,178,567
Less: Operating expenses including provision for taxes - - - - -	\$35,219,518	\$47,079,254	\$57,097,476	\$ 63,754,132
Depreciation - - - - -	5,528,381	5,490,531	6,601,311	8,136,196
Amortization - - - - -	1,000,000	1,000,000	1,000,000	1,000,000
Total Operating expenses, depreciation and amortization	\$41,747,899	\$53,569,785	\$64,698,787	\$ 72,890,328
Net Revenue before capital charges - - - - -	\$24,432,479	\$25,491,096	\$28,383,521	\$ 29,288,239
Less: Bond interest - - - - -	\$ 1,455,845	\$ 1,464,359	\$ 1,435,429	\$ 1,262,229
Sinking funds and other financial charges - - - - -	764,118	925,256	966,708	939,768
Total Capital charges - - - - -	\$ 2,219,963	\$ 2,389,615	\$ 2,402,137	\$ 2,201,997
Net Revenue for the year - - - - -	\$22,212,516	\$23,101,481	\$25,981,384	\$ 27,086,242

Increase in gross earnings from operations for 1948 over 1947 amounted to 10.1% as compared with 18.31% for 1947 over 1946.

Operating expenses for 1948 increased 11.6% over 1947 as compared with 21.28% for 1947 over 1946. This increase was principally due to higher prices for materials. The following is a tabulation of percentage of total operating expenses before depreciation and amortization to gross earnings from operations over the past four years.

1945	1946	1947	1948
54.06%	60.16%	61.67%	62.52%

Capital Expenditures and Loan Negotiations

The cash expenditures on capital account by the operating companies during the past four years were as follows:

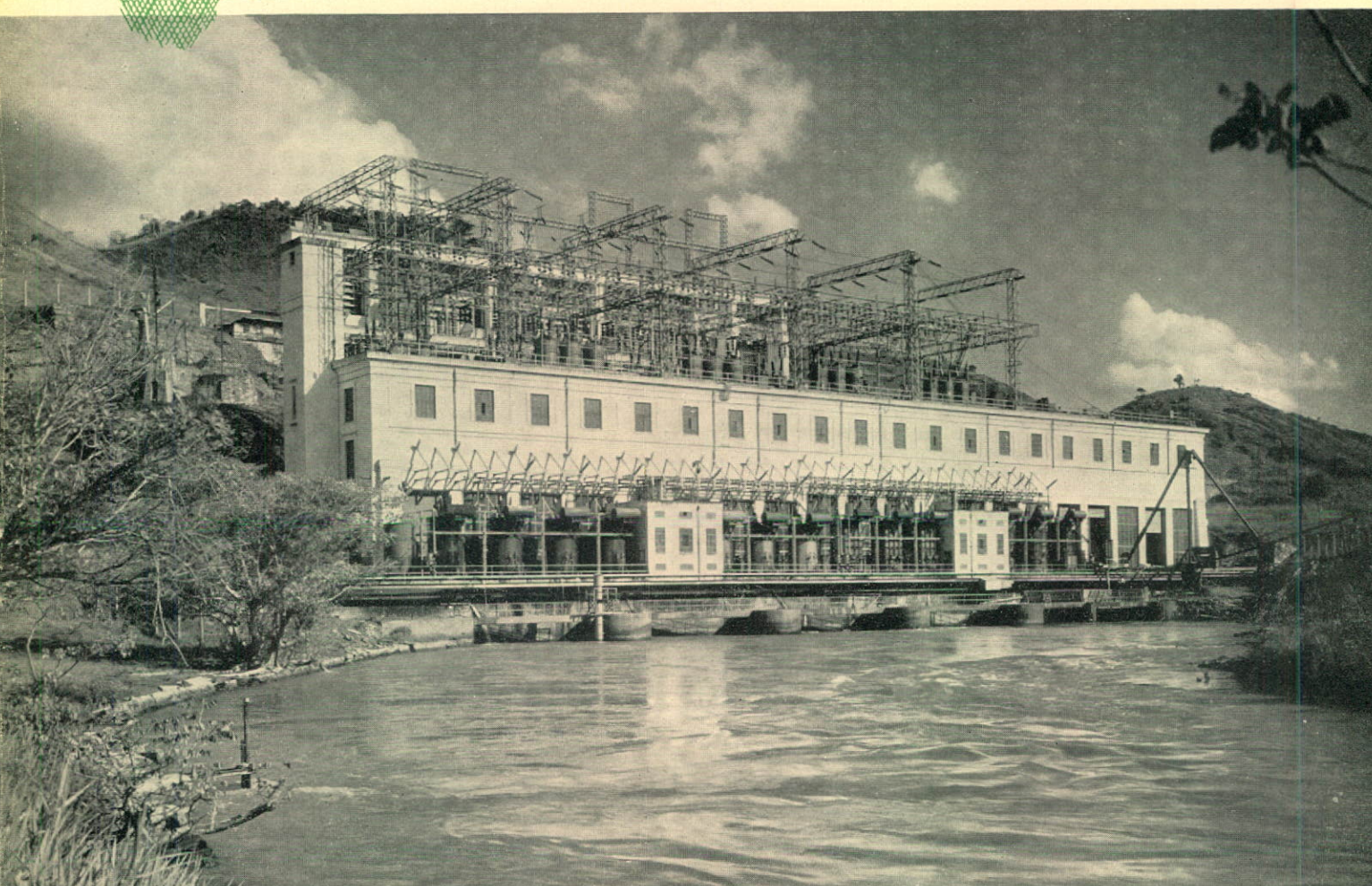
1945	1946	1947	1948
\$19,439,456	\$34,069,204	\$47,986,435	\$32,436,579

Capital expenditures during 1948 were 9% higher than had been estimated at the beginning of the year due chiefly to the advance delivery of certain equipment. In general, capital expenditures were on a restricted basis pending completion of the negotiations with the International Bank for Reconstruction and Development mentioned in last year's Annual Report. These negotiations were carried to conclusion during the year and the terms of a Loan Agreement were settled by the Company with the International Bank. Likewise the terms of a Guarantee Agreement were settled during the year between the Government of Brazil and the International Bank.

On November 19th, 1948, the Brazilian Congress passed legislation giving authority to the Brazilian Government to guarantee to the International Bank the repayment of the loan and accordingly both the Loan and Guarantee agreements were executed on January 27th, 1949.

Legal formalities in connection with the loan were completed on May 9, 1949, on which date the loan became effective. The amount which will be made available to your Company by the International Bank is \$75,000,000 U.S. or its equivalent in other currencies (except Cruzeiros) and your Company will be permitted to withdraw funds as these are required for the capital expenditure programme outlined in the Loan Agreement. The loan will be

ULHA DOS POMBOIS GENERATING STATION, PARAÍBA RIVER, INSTALLED CAPACITY 117,000 KW



evidenced by Collateral Trust Bonds of your Company and these bonds will be delivered to the International Bank from time to time as advances are made by the International Bank. The Collateral Trust Bonds will be secured by a floating charge on your Company's undertaking and specifically by debentures of several of the operating companies.

Interest is payable on the funds advanced by the International Bank at the rate of $3\frac{1}{2}\%$ per annum. In addition to interest, your Company is obliged to pay to the International Bank an amount equal to 1% per annum on such advances, this charge being required by the statutes of the International Bank for its reserve fund purposes. Your Company will pay a commitment fee on the amount of the loan not withdrawn, at the rate of $1\frac{1}{2}\%$ per annum for the first six months and thereafter at a rate based on a formula provided in the Loan Agreement which, as presently calculated, will be approximately $2\frac{1}{2}\%$ per annum.

The loan and the Collateral Trust Bonds mature on January 1st, 1974 and will be fully amortized at maturity by a sinking fund commencing in 1953.

The loan is guaranteed by the Government of Brazil, the guarantee being provided for in the Guarantee Agreement referred to above, and the Collateral Trust Bonds will bear this guarantee.

The purpose of the loan is to assist the Company in financing its capital expenditure programme for the development of the electrical and telephone services in Brazil. As this programme has now been under way since early in 1947, the International Bank, under the Loan Agreement, will also advance an amount equal to the expenditures, in currencies other than cruzeiros, made under the programme since May 1st, 1947.

The overall cost of the capital expenditure programme for electrical and telephone services to be carried out under the terms of the Loan Agreement is estimated at \$182,000,000, the non-cruzeiro portion of which is approximately the \$75,000,000 to be borrowed from the International Bank. Making allowance for the fact that work under the programme commenced at the beginning of 1947 it can now be estimated that it should be completed by the end of 1952.

The extent to which the construction programme has already been completed can be ascertained from the sections of last year's report and the present report dealing with the electrical and telephone services. The capital budget for the year 1949 has been tentatively set at \$40,000,000.

Your directors wish to point out to shareholders that while the loan arrangements made with the International Bank provide the funds for a substantial portion of the current capital expenditure programme, nevertheless, capital expenditure in addition to that included in the programme as such will have to be incurred during the period of the carrying out of the programme to meet the very rapidly growing demand on all of our services in Brazil.

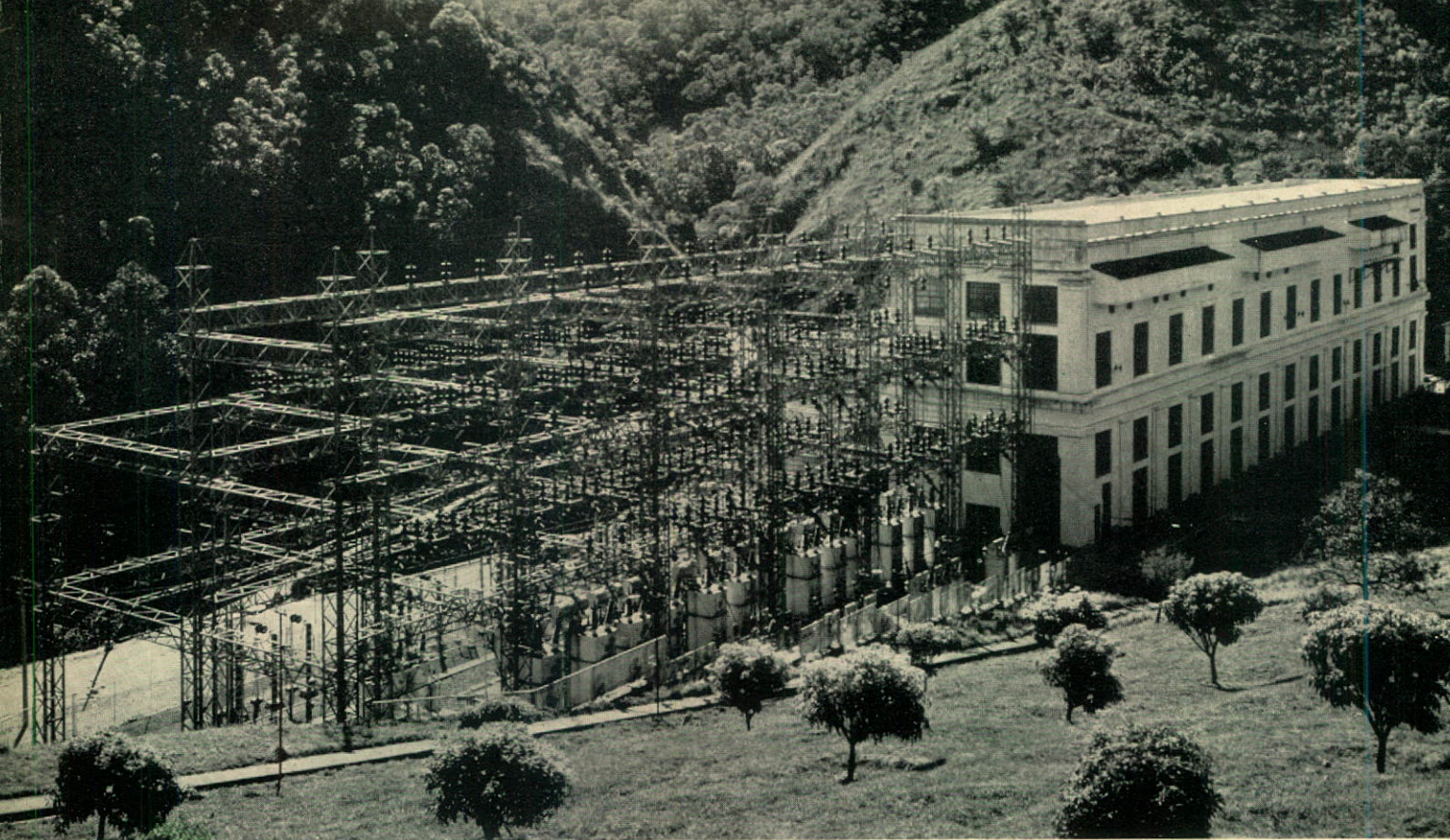
The electrical and telephone construction programme includes the following principal installations:



I. Electrical Services

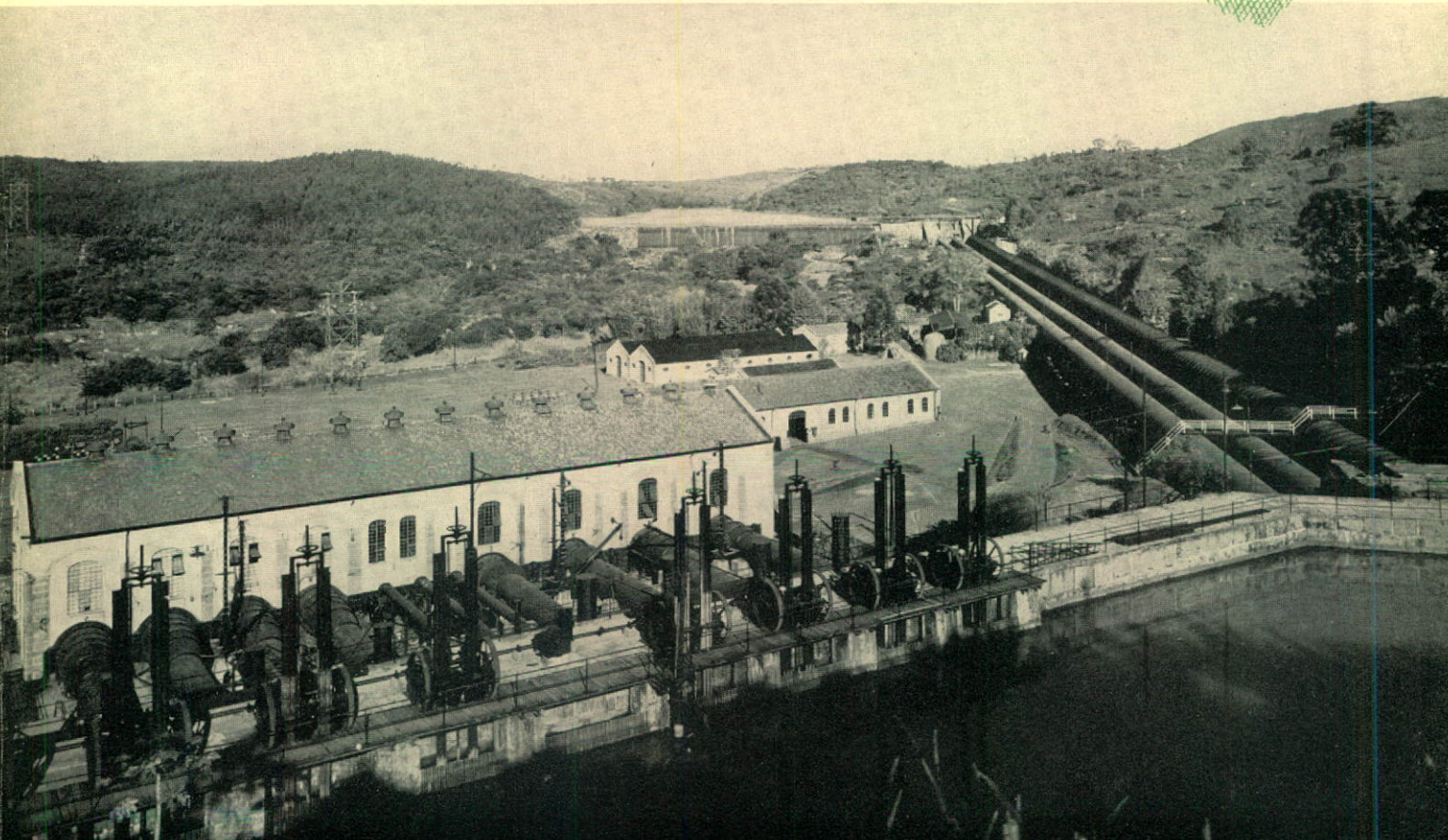
(a) SÃO PAULO SYSTEM

1. The installation of units Nos. 4, 6 and 8 at the Serra do Cubatão power plant, each of 65,000 kw, with the necessary extensions of the buildings, structures and transformer facilities required thereby.



ITUPARARANGA GENERATING STATION—56,124 KW CAPACITY

PARNAÍBA GENERATING STATION, TIETÉ RIVER, INSTALLED CAPACITY 26,172 KW



2. The enlargement of the Pinheiros canal supplying water to the Rio Grande reservoir which serves the Serra power plant and the installation of the additional pumps in the Pedreira and Traição pumping stations.
3. The installation of additional high-tension transmission lines, the construction of a new terminal station and ten new substations for augmenting the electrical transmission and distribution facilities of the São Paulo system.

(b) RIO DE JANEIRO SYSTEM

1. The installation of units C and D, each with a capacity of 35,000 kw at the Fontes power plant.
2. The installation of unit No. 5 with a capacity of 52,000 kw at the Ilha dos Pombos plant.
3. Necessary extensions to the powerhouses, transformer and switching facilities arising from the installation of the above mentioned units.
4. Additional high-tension transmission lines and substations for increasing the electrical transmission and distribution facilities of the Rio de Janeiro system.

(c) PARAÍBA-PIRAÍ DIVERSION PROJECT

The Paraíba-Piraí Diversion Project to augment the supply of water to the Fontes power plant by a series of dams, tunnels, reservoirs, canals and pumping stations, all as more fully described on page 8 of last year's annual report.

(d) SERRA-LAGES TRANSMISSION LINE

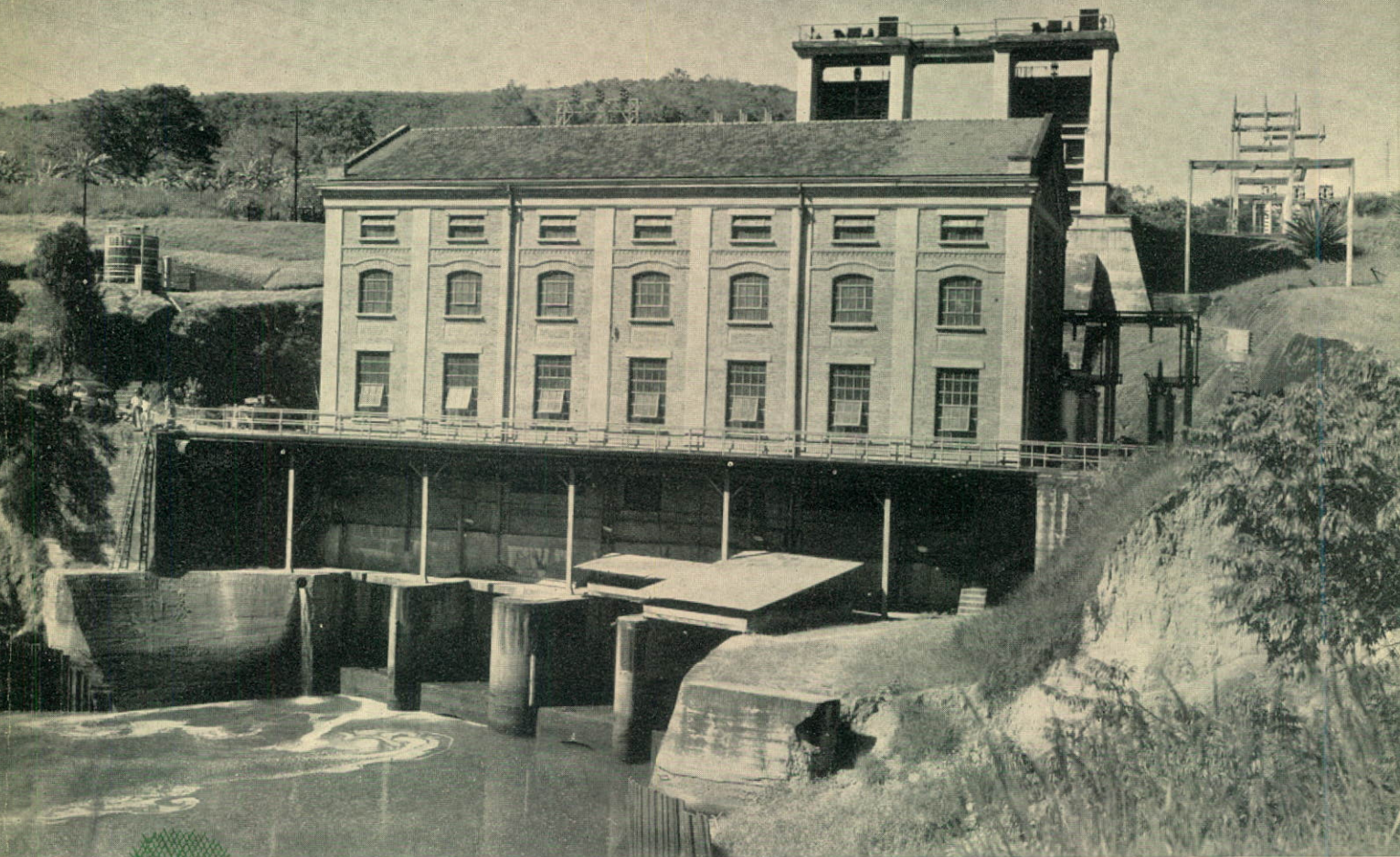
The completion of the Serra-Lages high-tension transmission line connecting the São Paulo and Rio de Janeiro electrical systems and the installation of a 50,000 kw frequency-changer at a point near Aparecida.

II. Telephone Services

In addition to the installation and placing into operation of automatic telephone equipment in the cities of Rio de Janeiro, São Paulo, Belo Horizonte, Santos, Niteroi, etc., involving a total of 160,000 additional telephones to provide service for 125,000 new subscribers, the programme includes the installation of nearly 40,000 kilometres of additional toll circuits and approximately 3,000 kilometres of toll pole lines throughout the area served by Brazilian Telephone Company.

TRAÇÃO PUMPING PLANT WITH ONE UNIT LIFTS 70 CUBIC METRES, 4.6 METRES EVERY SECOND





RASGÃO GENERATING STATION ON THE TIETÉ RIVER, STATE OF SÃO PAULO,
WITH AN INSTALLED CAPACITY OF 18,539 KW

Brazilian Exchange—1948

Liquidation of dollar exchange commitments continued to be difficult during the year, but the institution of import controls in the month of April, 1948 resulted in considerable improvement in the situation.

In July the Brazilian Government issued a statement to the effect that, in agreement with the International Monetary Fund, the par value of the cruzeiro had been fixed at 18 cruzeiros 50 centavos to the U.S. dollar. The selling rate of the Bank of Brazil for the U.S. dollar remained unchanged during the year at 18 cruzeiros 72 centavos.

The cruzeiro at closing sight rates of exchange on New York and London on the 31st day of December in 1947 and 1948 stood as follows:

	1947	1948
Free Market on New York - - - - -	5.34 cents	5.34 cents
Free Market Sterling Area - - - - -	3.47/256d.	3.46/256d.

The current assets and liabilities of the operating companies in Brazil were valued at the end of the year in dollars at the closing sight rate of exchange on the "Free Market" for exchange on New York.

The combined earnings of the operating companies, expressed in dollars, which heretofore have been published monthly and which also appear in total in the tabulated statement on page 4 of this report, are calculated at the above rate of 18 cruzeiros 72 centavos per U.S. dollar. Experience has shown, however, that owing to the number and variety of the provisions that have to be made, monthly earnings figures tend more and more to become estimates and in the interests of greater accuracy your directors propose to publish them half-yearly instead of monthly as in the past.

Dividends Paid

In addition to the usual quarterly dividends on the small outstanding balance of the preference shares, two dividends were paid during the year on the ordinary shares of the Company, viz: \$1.00 on June 2nd and \$1.00 on December 15th, (Canadian funds).

Electric Power Supply

The high rate of load growth mentioned in previous reports has continued. The generation for 1948 compared with 1947 is shown by the following tabulation:

RIO SYSTEM	1947	1948	Increase over 1947
(Including power received from São Paulo)			
Maximum Demand (kw)	260,700	289,100	28,400 or 10.9%
Energy (kwh)	1,315,878,500	1,510,093,000	194,214,500 or 14.8%
SÃO PAULO SYSTEM			
(Excluding power sent to Rio)			
Maximum Demand (kw)	423,764	483,259*	59,495 or 14.0%
Energy (kwh)	2,358,181,207	2,693,468,792	335,287,585 or 14.2%

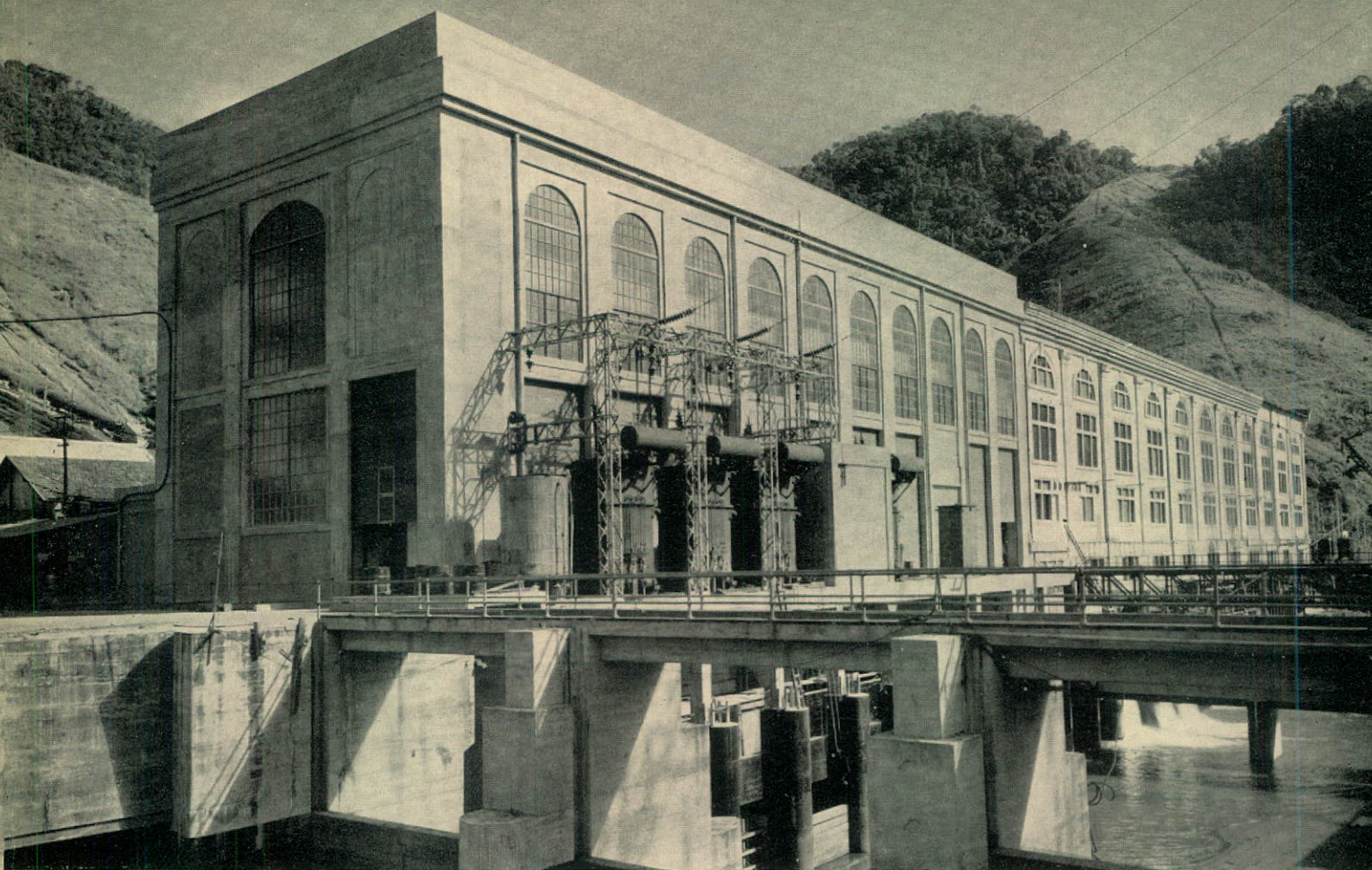
*A maximum demand peak of 503,000 kw occurred while transmitting power to the Rio system.

In general, river flows during the first 10 months of 1948 were close to average. However, during the latter part of the year they were less than average and the heavy rains of the wet season, normally beginning about mid-November, failed to occur. This situation is not expected to affect adversely the São Paulo system but reserve storage for the Rio system was less than had been anticipated. This reduced storage, combined with the continued high increase in the rate of electrical energy consumption, pending completion in 1952 of the Paraíba-Piraí diversion project, may require the imposition of further restrictions on the use of electrical energy in the Rio system. In this connection it must be realized that the whole system, as mentioned in the last annual report, is still operating without any adequate spare capacity and there is a risk of being unable to maintain full service in emergencies. This is especially so since it is expected that the Fontes plant will from now on draw more water from the reservoir than will be made good by normal rainfall, until such time as additional supplies are furnished by the Paraíba-Piraí diversion project.

RIO SYSTEM

No additional generating units were placed in service on the Rio system during 1948.

With the exception of engineering studies and investigations, all work in connection with



FONTES GENERATING STATION CONTAINS ELEVEN UNITS OPERATING UNDER 1,100 FT. HEAD

the installation of unit "D" and other future units at Fontes power plant has been postponed until work starts again on the Paraíba-Piraí diversion project.

Construction work on the Paraíba-Piraí diversion project mentioned in last year's report, was suspended pending completion of negotiations with the International Bank. Advantage was taken of the shut-down period to overhaul all construction plant and equipment and to make further engineering studies of alternate plans for the project which, it is expected, will result in economies when work is resumed.

Work on the installation of the fifth unit at the Ilha dos Pombos plant was continued. This unit is rated at 52,000 kw and, as previously stated, is expected to be placed in service in 1950.

The principal additions to the Rio distribution system consisted of the installation of step-down transformers at three substations, namely: Copacabana, where the capacity was raised from 6,000 to 15,000 kva; João Vicente (Deodoro) raised from 3,000 to 6,000 kva; and Nova Iguaçu (state of Rio de Janeiro) raised from 500 to 1,000 kva. The number of high-tension consumers was also increased by the connection of 47 new privately owned substations with a total capacity of 16,600 kva. The conversion from overhead to underground distribution in the Copacabana zone was completed during the year, some 80 circuit kilometres were added to overhead distribution circuits of the system, and the transformers feeding the low-tension network were increased by 9,890 kva.



SERRA DO CUBATÃO GENERATING STATION, INSTALLED CAPACITY 407,847 KW, OPERATING UNDER 2358 FT. HEAD.

SÃO PAULO SYSTEM

Generator unit No. 6 at Serra do Cubatão with its penstock and powerhouse extension was placed in service in April, 1948 as mentioned in the last report. Despite this addition and that of unit No. 4 in 1947, the generating capacity of the system is still insufficient to meet the demand.

Preparatory work for the installation of unit No. 8 was started. This unit will be installed at the east end of the powerhouse and is expected to be placed in service by the end of 1950.

The stator winding of generator No. 2, which has been in service since the inauguration of the Serra do Cubatão plant, was replaced at the end of last year and improvements introduced have increased the capacity of this generator from about 28,000 kw to 41,000 kw.

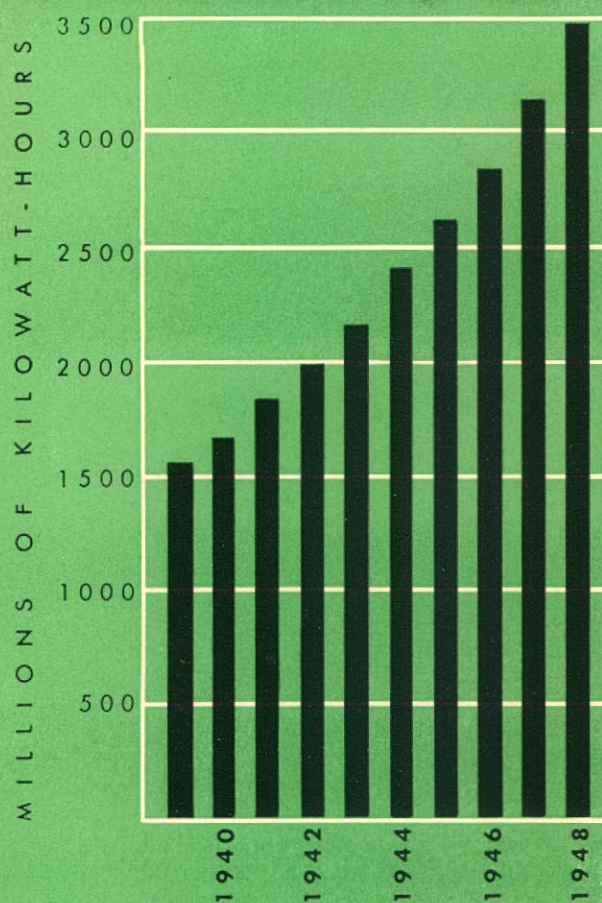
The series of drainage tunnels, ditches and other measures employed to drain and stabilize the movement of the large earth slide at the west end of the powerhouse, mentioned in last year's annual report, were completed with satisfactory results.

The widening and deepening of the Pinheiros Canal, for an ultimate capacity of 280 cubic metres of water per second, was suspended during the year. The 70 cubic metres of water which can now be diverted into it are adequate for present needs and the only work performed during the year was dredging operations needed to remove silt from the channel.

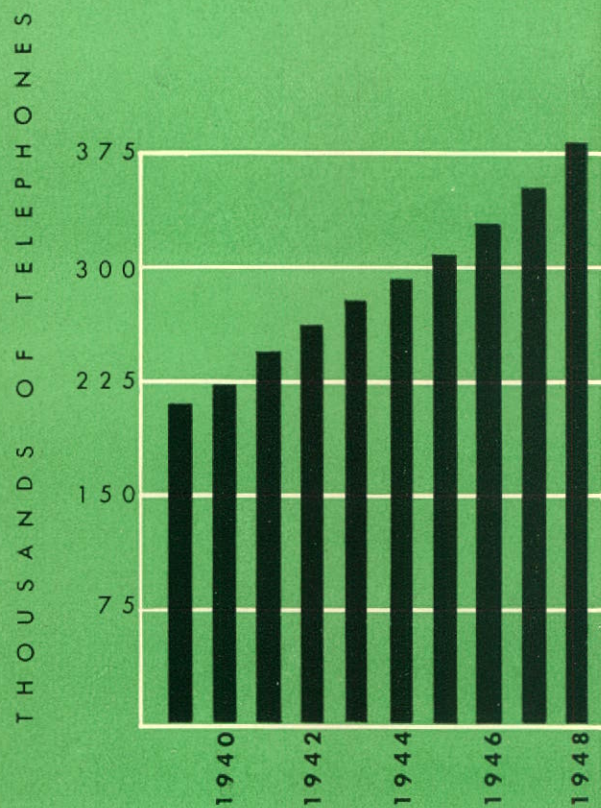
The installation of Traição pump No. 2 has been postponed until 1951.

(Continued on page 14)

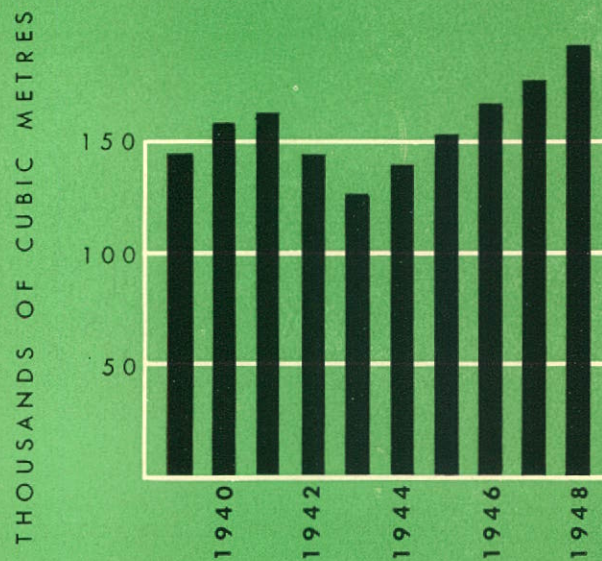
SALES OF ELECTRICITY - KWH



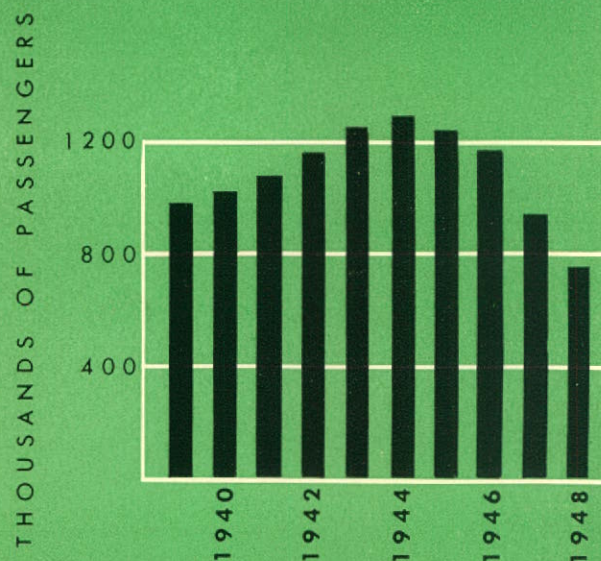
TELEPHONES IN SERVICE



SALES OF GAS - CUBIC METRES

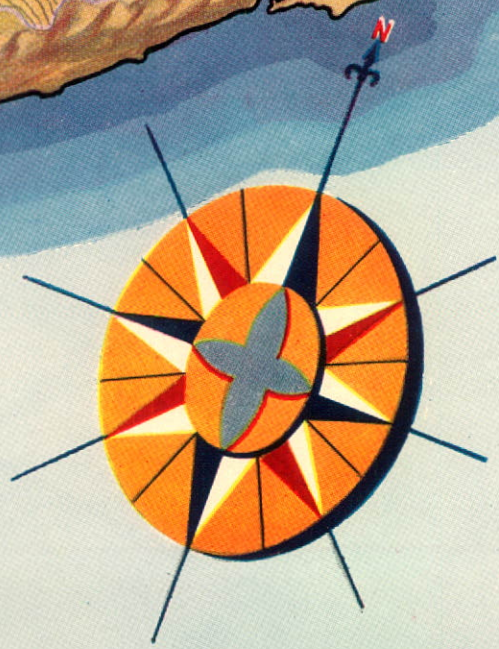


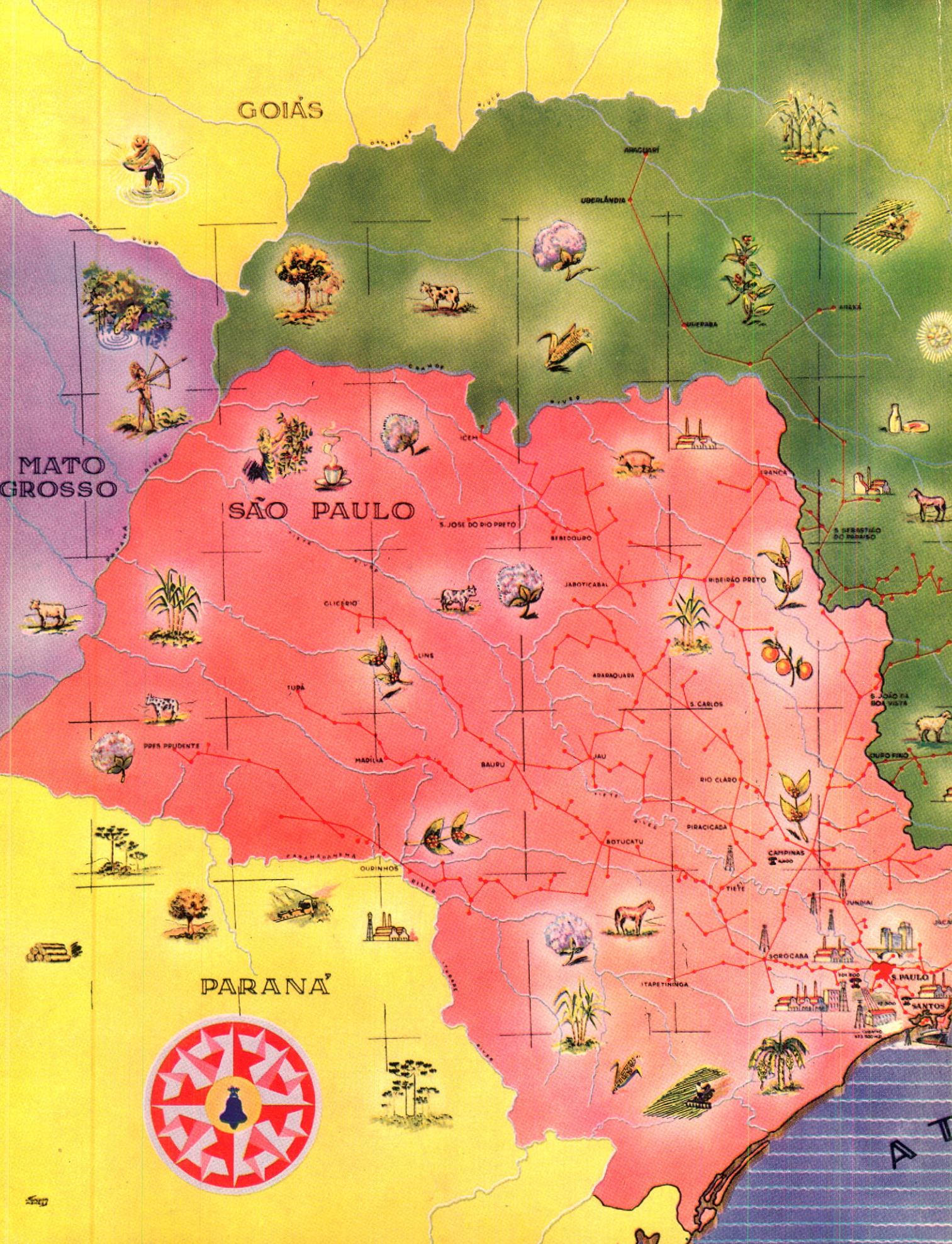
TRACTION SERVICES PASSENGERS RECORDED





A T L A N T I C





GOIÁS

MATO
GROSSO

SÃO PAULO

PARANÁ





NOTE:
 Figures shown opposite
 principal cities represent
 the number of telephones
 connected.
 The total number of
 telephones connected
 is 380,500.

ATLANTIC OCEAN



BRAZILIAN TELEPHONE COMPANY'S
 SYSTEM
 1948







METRIC SCALE

0 5 10 15 20 25 30 35 40 45 50 55 60

SCALE 1:500,000

ENGLISH MILES

0 5 10 15 20 25 30 35

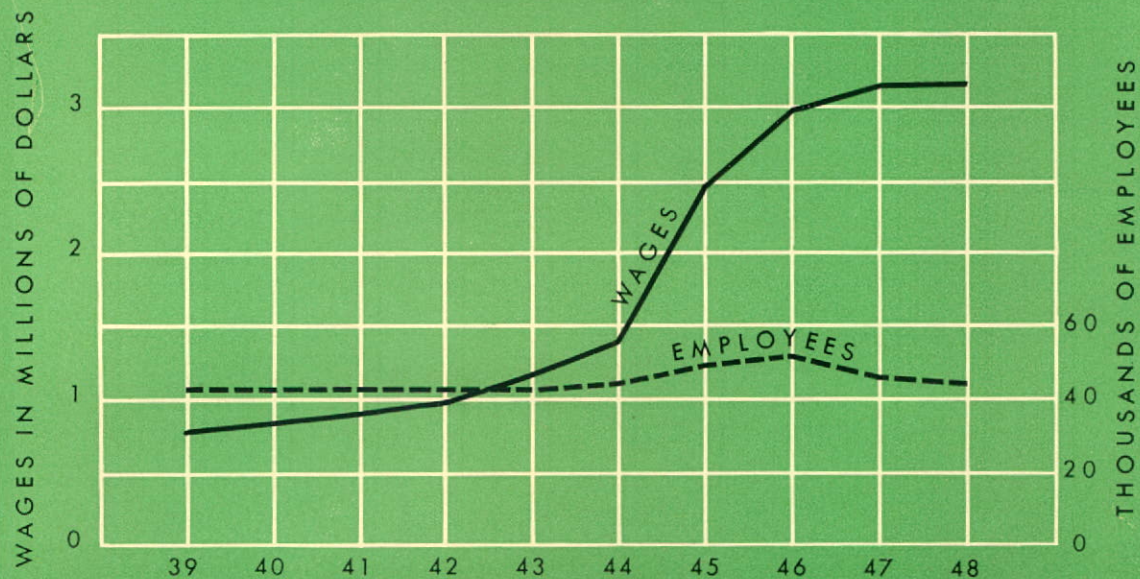
1 MILE = 1609 METERS

O C E A N

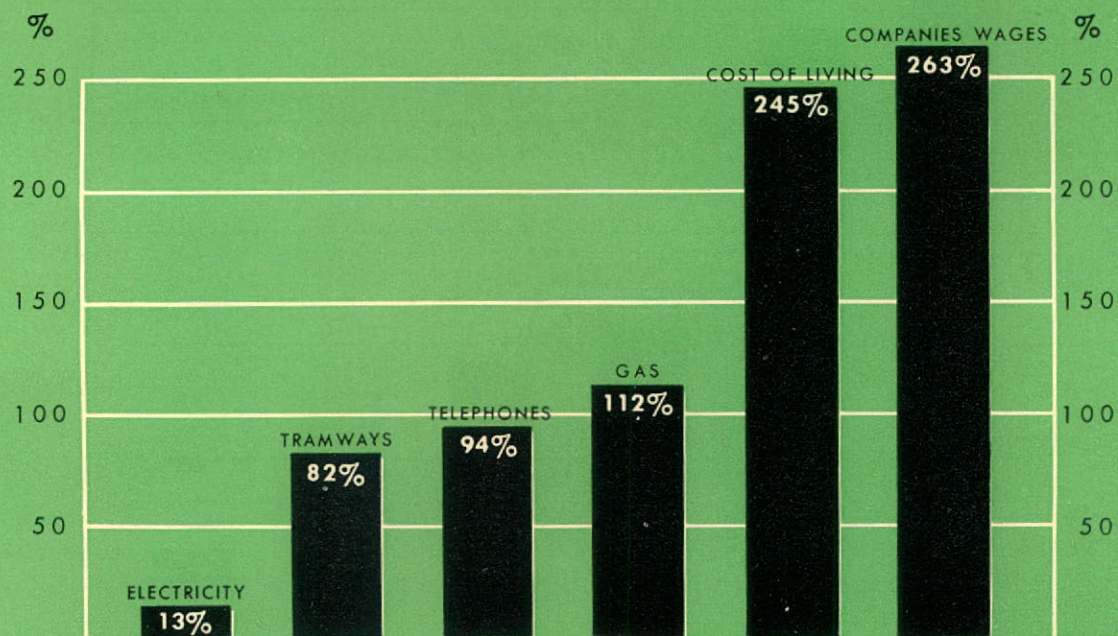
STATISTICS OF COMBINED COMPANIES

	1944	1945	1946	1947	1948
Electric Light and Power					
Kilowatt-hours Sold - - - - -	2,395,847,529	2,606,418,262	2,825,522,186	3,092,006,765	3,482,345,144
Capacity of Generating Plants (kw) -	612,570	662,570	662,570	757,466	822,271
Total Connected Load (kw) - - -	1,564,806	1,725,853	1,839,043	1,984,920	2,196,454
Total Consumers - - - - -	662,734	694,957	731,751	768,014	811,338
Transmission Lines (miles of circuit) -	2,090.80	2,091.33	2,069.31	2,335.31	2,411.36
Distribution Lines (miles of wire) - -	34,125.55	35,332.60	36,759.23	38,506.54	40,441.27
Telephones					
Total Number of Telephones in Service	290,880	305,889	325,893	349,492	380,260
Average Daily Calls - - - - -	5,113,921	5,531,667	6,159,054	6,465,860	7,028,629
Wire Strung (miles) - - - - -	1,403,366	1,512,224	1,545,874	1,652,254	1,690,833
Pole Lines (miles) - - - - -	7,818	8,044	8,268	8,543	8,769
Gas					
Gas Sold (Cubic metres) - - - - -	138,980,937	152,175,571	166,081,567	176,426,486	193,199,198
Total Consumers - - - - -	170,426	178,108	181,746	190,513	205,439
Mains Laid (miles) - - - - -	1,250.04	1,259.87	1,272.23	1,279.33	1,296.29
Stoves, Water Heaters and Other Appliances - - - - -	186,962	188,181	189,465	190,635	202,632
Traction					
<i>Tramways:</i>					
Total Track (miles) - - - - -	527.94	527.07	525.34	356.87	356.52
Rolling Stock:					
Passenger Cars - - - - -	2,063	2,062	2,077	1,504	1,513
Freight and Service Cars - - -	270	270	257	188	188
<i>Funicular Railway:</i>					
Total Track (miles) - - - - -	2.56	2.56	2.56	2.56	2.56
Rolling Stock:					
Electric Locomotives - - -	4	4	4	4	4
Passenger Cars - - - - -	4	4	4	4	4
Freight and Service Cars - - -	2	2	2	2	2
<i>Buses:</i>					
Route (miles) - - - - -	132.37	132.37	138.13	121.20	
Number of buses - - - - -	142	118	93	74	
<i>Car Miles Run:</i>					
Tramways - - - - -	74,969,804	74,768,681	74,690,141	60,785,201	48,342,751
Funicular Railway - - - - -	18,132	20,025	22,591	21,427	22,787
Buses - - - - -	5,283,569	4,578,098	4,095,829	4,092,642	2,038,792
Total - - - - -	80,271,505	79,366,804	78,808,561	64,899,270	50,404,330
Total Passengers Recorded - - - -	1,289,812,422	1,239,612,655	1,162,589,794	932,426,248	747,193,332
Water					
Water Sold (Cubic metres) - - -	13,165,587	13,007,566	13,275,009	13,976,733	14,521,631
Total Consumers - - - - -	24,217	24,625	25,312	26,101	27,289
Trunk Mains Laid (miles) - - -	37.97	37.68	37.76	37.67	37.66
Distribution Mains Laid (miles) - -	269.58	272.11	275.72	279.36	284.68

WAGES AND EMPLOYEES OF OPERATING COMPANIES IN BRAZIL DECEMBER FIGURES



COMPARATIVE INCREASES IN THE COMPANIES' TARIFFS, COST OF LIVING, AND COMPANIES' WAGES — December 1948 over December 1939



Principal additions to the São Paulo system were three new substations, namely, Santa Terezinha, Electrocloro and São Bernardo. A total of 32,000 kva of high-tension step-down transformers were installed in all the system substations. The high-voltage transmission system was augmented by 88.2 circuit kilometres of 88 kv line and 16.5 circuit kilometres of 40 kv line.

In the city of São Paulo the distribution system was expanded by the installation of 35,933 kva of distribution transformers and 12 new feeders. In addition 16,290 kvar of static condensers were installed.

SERRA-LAGES TRANSMISSION LINE

The 330 kilometre, 230,000-volt transmission line for interconnecting the Rio and São Paulo systems was completed during the year, as was also the installation of the 75,000 kva transformer bank at Cubatão to connect the line to the station. The line and transformer bank went into service on August 8th for the purpose of transmitting energy to the Rio system. Because of the difference in frequency, this aid to the Rio system is carried out at night and on Sundays and holidays or whenever conditions permit isolating one or two of the Serra units and operating them at 50 cycles. From its initiation on August 8th, a total of 92,657,600 kwh were transmitted from São Paulo to the Rio system in this manner during 1948.

Delivery of parts for the frequency-changer at Aparecida began towards the close of the year and preparatory work for its installation was started. It is expected that this frequency-changer will be ready for service in 1950.

ELECTRIFICATION OF RAILWAYS

The trend towards electrification of railways is continuing in your Company's territory.

During 1948 the Estrada de Ferro Central do Brasil installed a new 6,000 kw substation at Caramujos between Rio de Janeiro and Japerí and a branch line of 9 kilometres from Japerí to Taireté was electrified. Work was also continued on the electrification of the main line from Japerí to Barra do Pirai, 40 kilometres of double track which climb the Serra to a height of 440 metres. Consumption of energy by this railway rose to 92,641,000 kwh in 1948 which was an increase of 21.4% over 1947.

The electrification by the Companhia Paulista de Estradas de Ferro of the Baurú branch was completed and inaugurated during 1948, and this railway is studying the electrification of several other stretches.

The Sorocabana Railway expects to put into service a new substation at Cerquilho early this year. Six new electric locomotives were placed in service in December and twenty more are in course of delivery. Consumption of energy increased by 21% over 1947.

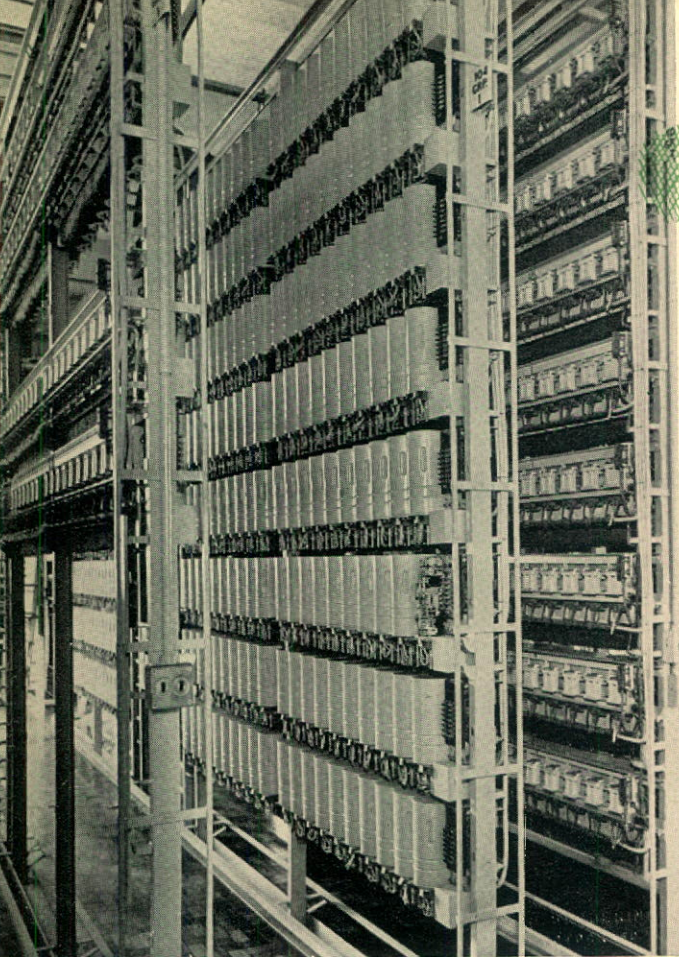
Work was continued by the Companhia Estrada de Ferro Santos-Jundiaí on the electrification of the main line between São Paulo and Jundiaí and it is expected that this section will be ready for service by the end of 1949.



Telephone Service

Although 30,768 new telephones were connected to the system during the year, representing an increase of telephones in service of 8.8% over 1947, the shortage of materials continued and it was impossible to satisfy the demands of many prospective subscribers. The number of prospective subscribers awaiting connections totalled 143,360 on December 31st, 1948.

During the year 1948 the capacity of the Company's telephone system was increased by 24,500 lines by the construction of two new central exchanges in the Federal District, one



BANKS OF SELECTORS IN TELEPHONE EXCHANGE AT SÃO PAULO



AN AUTOMATIC TELEPHONE OFFICE, RIO DE JANEIRO



NEW SANTOS AUTOMATIC TELEPHONE OFFICE IN RESIDENTIAL DISTRICT

in the city of São Paulo and one in Santos, besides some additions to various central exchanges in the first mentioned area.

The municipal government in Rio de Janeiro granted a revision of tariffs as called for in the existing municipal concession. The new rates were put into effect on 1st August, 1948 and will be in force for five years.

Two new central exchanges are being installed in Rio de Janeiro and one in Belo Horizonte, all of which should be ready for service in 1949.

Telephone call offices were installed in Cachoeiro de Itapemirim and Mimoso do Sul in the state of Espírito Santo, thus extending the Company's toll service into another state. Construction work is under way which will allow the establishment of a new call office in Vitória, the capital of Espírito Santo, early in 1949.

During the year the installation of four 12-channel carrier systems between the toll board in Rio de Janeiro and the toll board in São Paulo continued. This will provide 48 extra lines to relieve the existing congested service conditions which at present cause considerable delays. The bulk of construction work on this Rio-São Paulo project was completed in 1948.

During the year 17,159,701 toll calls were completed, an increase of 10.33% over 1947, when the total number was 15,522,667.

Gas Service

Coal supplies improved both in quantity and quality and for the first time since the war shipments were received from Great Britain. Maintenance materials continued in short supply and, due to shortage of production plant, it was necessary to continue rationing restrictions. Even under these conditions the total sales of gas showed an increase of 9.5% over 1947 and there was an increase of 7.5 % in the total number of consumers.

In Rio de Janeiro a new restaurant building was completed at the gas works and work was completed on the piling for the foundations of the new 3-million cubic ft. gas holder which is under construction. One battery of obsolete retorts was reconstructed as intermittent vertical chambers of the latest design with a carbonizing capacity of 90 tons of coal per day.

In São Paulo and Santos normal maintenance work was carried out.

Transportation

The tramways in the cities of Rio de Janeiro and Santos operated throughout the year 1948 with the same fares as were in force at the close of 1947, and the gross revenue showed an increase of approximately 5% over the previous year in spite of a larger number of competing bus services. Notwithstanding this the net loss on operations was greater than in 1947.

Negotiations for fare increases were carried on throughout the year in both cities. In Rio de Janeiro a special commission was nominated in April to check revenue and operating expenses and make recommendations. This commission presented its report at the close of the year, by which time all the employees of the Rio companies were demanding a general increase in salaries. The settlement of this demand is more specifically dealt with later in this report but as the fare increases granted in the case of the tramways will be absorbed by the higher wages, it is expected that these services will continue to be unremunerative.

At the beginning of the year the Company was operating 63 buses over 11 routes in the city of Rio de Janeiro. By agreement with the municipal authorities the services were suspended one by one until the last route was discontinued on November 15th.

Foreign Trade of Brazil

By the judicious use of an import licence system, Brazil during 1948 was able to bring her international trade into better adjustment. Following an adverse international trade balance of Cr\$1.609.877.000 for 1947, a decree was issued in February, 1948 to restrict the importation of goods considered unessential and ration the importation of essential commodities, giving preference to buying in countries where the exchange position was more favourable.

These measures had little effect during the first six months of the year and by the end of June the adverse balance of trade amounted to Cr\$2.320.761.000. During the second half of the year, however, imports fell considerably and for the full year of 1948 a favourable balance of trade was once again recorded, as may be seen from the following table giving exports, imports and balance of trade for the years 1944 to 1948 inclusive:

	1944	1945	1946	1947	1948
	Thousands of cruzeiros				
Exports - - - -	10.726.509	12.197.510	18.229.532	21.179.413	21.696.874
Imports - - - -	7.965.141	8.617.320	13.028.734	22.789.290	20.984.880
Balance of trade - -	2.761.368	3.580.190	5.200.798	-1.609.877	711.994

NOTE: 1,000 cruzeiros are equivalent to approximately \$53.00 at the present rate of exchange.

The balance of trade with the United States for the year 1948 showed considerable improvement over 1947, but still resulted in an adverse balance of Cr\$1.488.987.000, or approximately \$79,400,000.

Corresponding figures released by the U.S. Department of Commerce show a balance of \$16,300,000 in Brazil's favour. The discrepancy is largely due to the fact that the U.S. Department of Commerce figures are for American exports and are based on f.o.b. U.S. port values, while Brazilian figures include freight, insurance, commissions and other charges which make up a substantial part of Brazil's dollar commitments.

On May 21st, 1948, a trade agreement was signed between Brazil and Great Britain which contained a list of the commodities which each country considered it was desirable to trade in and established the quantities which it was thought possible to supply and receive in this manner and thus maintain a balance in exchange.

While the targets set were not in all cases reached by the end of the year this agreement undoubtedly contributed towards the increase in Anglo-Brazilian trade which occurred in 1948. The agreement was extended to March 31st, 1949, and its renewal is under negotiation between the two countries.

Exports in 1948 showed an increase of 23% in tonnage but only 3% in value, due to a decline in the average value per ton of the raw materials and foodstuffs exported. Coffee, raw cotton, cocoa, lumber and hides were the five principal exports, accounting for 69% of the total, coffee alone representing 41%. Shipments of coffee in 1948 amounted to 17,492,324 bags—a figure only surpassed in the record year of 1931—an increase of 19.1% over 1947. The value of coffee exported in 1948 was Cr\$9.018.564.000, which is 16.35% higher than the 1947 figure.

The efforts of the Brazilian Government to increase the production of wheat within the country are giving satisfactory results and the importation of foreign wheat and flour in 1948 was 114,500 tons lower than in 1947. It is now expected that the harvest of home-grown wheat will increase progressively from year to year.

Brazil's Industrial Development

Two important studies were made in Brazil during the year with a view to achieving a more balanced economy. The first was a five-year plan developed by leading members of all political parties and at present under study in Congress. This is known as the S.A.L.T.E. plan, the letters standing for Saude (Health), Alimentação (Food), Transportation and Energy. The project contemplates the expenditure of Cr\$18.800.000.000 over the five-year period 1949-1953 and includes a detailed programme of the work to be undertaken by the Government in each sector. The plan provides funds for rural electrification and for the building of a hydro-electric power plant on the São Francisco River, but leaves the development of other power plants mainly to private enterprise.

The installation of oil refineries in Brazil and the construction of oil pipe lines between the port of Santos and the city of São Paulo, projects which were mentioned in last year's report, are also included in this five-year plan.

The second set of studies was undertaken by a joint U.S.-Brazilian technical commission. The American specialists visited Brazil at the invitation of President Dutra and were headed by Mr. John Abbink. The chairman of the Brazilian delegation, and co-chairman of the commission, was Dr. Octávio de Bulhões a prominent official of the Ministry of Finance. The Commission unanimously agreed that the economic development of Brazil should be accelerated by carefully considered programmes of governmental expenditures, by policies favouring a balanced development of Brazil's resources by private enterprise, and by policies directed specifically toward controlling inflation and meeting the balance of payments problem.

Your companies have continued their policy of purchasing as far as possible material produced in Brazil, but these purchases were reduced as compared with 1947 due to the restricted construction programme and in an effort to utilize existing stocks. Such purchases, totalling \$7,256,300, include a great variety of goods, the most important of which, in dollar value, were:

Cement - - - - -	\$ 173,800	Fuel (Coal) - - - - -	\$ 324,750
Clay and Products		Lumber - - - - -	356,150
(Ducts, bricks, tiles, etc.) -	164,200	Office Supplies - - - - -	477,600
Copper (Wires and Cables) -	1,175,500	Rubber Goods (Tires and Tubes)	122,400
Cotton Goods (Canvas, thread,		Steel and Iron - - - - -	406,600
string, cords and waste) - -	210,450	Stone - - - - -	233,400
Electrical Machinery,		Telephone Apparatus	
Apparatus and Appliances -	758,950	and Appliances - - - - -	1,425,800
Foodstuffs - - - - -	507,900		
			<u>\$6,337,500</u>

As shareholders are aware the operating companies maintain large general purpose shops for manufacturing, repairing and salvaging equipment and supplies. During the year the value of all material produced in these shops excluding maintenance work, totalled \$4,511,800.

Purchases by the operating companies of iron and steel were much below the previous year for the reasons stated above, but the output of the steel mills of the Companhia Siderúrgica Nacional, at Volta Redonda, showed a considerable increase from 94,342 tons in 1947 to 198,277 tons in 1948 for rolled mild steel products. This is evidenced also by its power consumption of 66,396,800 kwh in 1948, compared with 34,345,000 kwh in 1947, an increase of 93%.

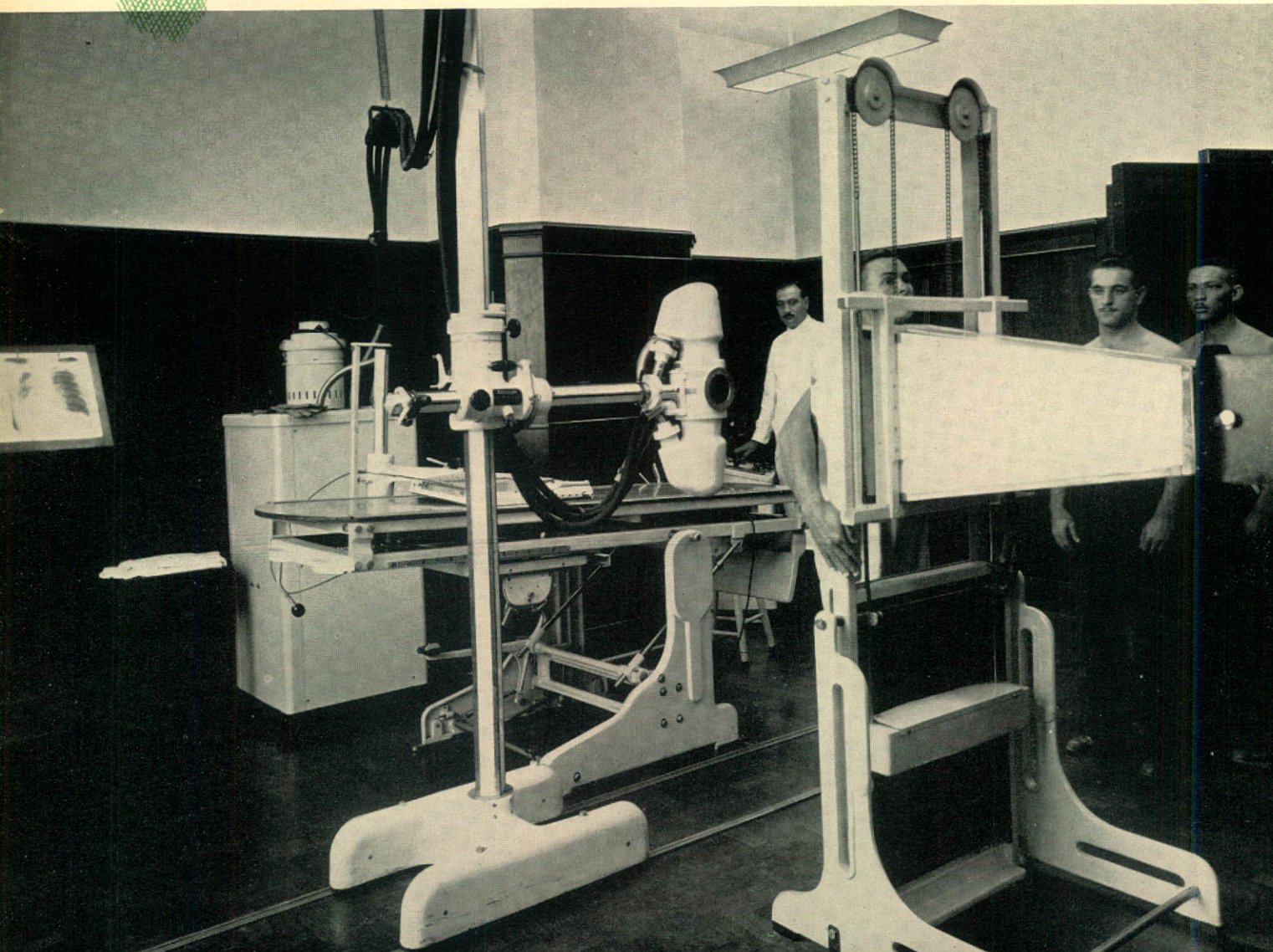
Sales of electrical energy for industrial purposes in the Rio de Janeiro and São Paulo districts continued to grow, there being an increase of such sales in the combined systems of 13.8% in 1948 compared with 1947.

Industries which showed the greatest development from the point of view of energy consumption were:

	Percentage of 1948 total energy sales	Increase in energy consumption over 1947
Chemicals - - - - -	3.5%	60.8%
Steel Mills and Foundries - - - - -	10.0%	26.3%
Cold Storage - - - - -	2.4%	19.3%
Textiles—Silk - - - - -	5.6%	16.5%
Building Loads (inc. elevators, etc.) - - -	3.9%	15.7%
Foodstuffs and Baking - - - - -	1.8%	14.4%
Machine Shops and Metal Works - - - -	6.1%	10.7%
Paper Mills and Products - - - - -	6.3%	8.5%
Water Supply and Sewage - - - - -	2.9%	19.2%
Railway Electrification - - - - -	13.6%	11.4%

Requests for new connections and extensions in existing services both in the Rio de Janeiro and São Paulo districts at December 31st corresponded to an additional unfilled demand of 94,250 kw.

COMPANY'S X-RAY MACHINE IN SÃO PAULO OFFICE WHERE ALL NEW EMPLOYEES ARE X-RAYED



Political

Considerable effort is being made by the Federal Government and state Legislative Assemblies in the democratic establishment of state and municipal rights, in conformity with the new Brazilian Constitution of 1946. This movement appears to be facilitated by an agreement between the majority and leading opposition political parties whereby members of the latter have accepted portfolios in the Federal Cabinet.

The cordial relations which already existed between Canada and Brazil were further improved by the visit in June, 1948 of Their Excellencies the Governor-General and Viscountess Alexander who were enthusiastically received by the Brazilian Government and people.

Labour Relations

Throughout the year your operating companies encountered very difficult labour problems which, with the co-operation of the Government and the unions involved, resulted in a wage-tariff agreement in February, 1949. This agreement increases wages on the average by 26.5% and increases tariffs concurrently by an amount almost sufficient to meet the wage increases and the added cost of two new social laws.

The two new social laws were passed by Congress just before the termination of its 1948 session. The first law permits the retirement on pension equal to full salary up to a maximum of Cr\$4.100, per month for public utility employees after 35 years of service, or with 80% after 30 years. The funds for these pensions are administered by the Government, but your operating companies contribute proportionately for each eligible employee. The second law provides a weekly day of rest with pay for each employee and double pay for those obligated to work on public holidays. The latter law supersedes the limited rest day payment made by your companies as a voluntary concession since August 1st, 1947.

The cost of living during 1948 continued to rise to some extent, the official cost of living indices for the month of December, 1948 showing an increase over 1939 of 244.97% for hourly paid workers and 205.09% for salaried workers as against 231.42% and 195.94% respectively at the end of 1947.

The total number of employees in the operating companies in Brazil as of 31st December, 1948 was 44,540, a decrease of 1,583 compared with 31st December, 1947. The decrease was principally due to the release of 1,061 employees of the hydro-electric construction crews and the closing down of the company's bus service in the city of Rio de Janeiro.

Deaths of The Viscount Greenwood and Mr. C. D. Magee

It is with deep regret that your directors record the death of two directors during the past year. The Rt. Hon. Viscount Greenwood, P.C., who had served as a director resident in England for six years, died on September 10th, 1948. Mr. C. D. Magee, who had served as a director resident in Toronto for some sixteen years, died on March 24th, 1949. Both of these directors will be sadly missed by their colleagues.

Staff

Your directors wish to record their appreciation of the loyal and efficient services of the Company's staffs throughout the entire organization.

TORONTO,
10th MAY, 1949.

For the Board of Directors,
HENRY BORDEN, President.

AUDITORS' REPORT TO THE SHAREHOLDERS

We have audited the Head Office accounts of Brazilian Traction, Light and Power Company, Limited, The Rio de Janeiro Tramway, Light and Power Company, Limited, Brazilian Telephone Company, The São Paulo Tramway, Light and Power Company, Limited, São Paulo Electric Company, Limited (and its subsidiary, The San Paulo Gas Company, Limited), The City of Santos Improvements Company, Limited and Brazilian Hydro Electric Company, Limited, and have examined the reports and statements submitted by other chartered accountants covering the capital and revenue accounts and provisions for depreciation in Brazil for the year ended 31st December, 1948. We have obtained all the information and explanations which we have required.

The aggregate profits and losses of subsidiaries, the assets and liabilities of which are not included in the consolidated balance sheet, have been fully provided for in the statement of consolidated profit and loss.

Subject to the foregoing, we report that, in our opinion, the attached consolidated balance sheet, and related statements of profit and loss and earned surplus are properly drawn up so as to exhibit a true and correct view of the state of the combined companies' affairs at 31st December, 1948, and of their operations for the year ended on that date, according to the best of our information, the explanations given to us, the reports of the auditors in Brazil and as disclosed by the books.

CLARKSON, GORDON & Co., } *Auditors.*
Chartered Accountants, }

Toronto,
10th May, 1949.

BRAZILIAN TRACTION, LIGHT AND POWER COMPANY, LIMITED AND ITS PRINCIPAL SUBSIDIARY COMPANIES

ASSETS

	31st December 1948	31st December 1947
Plant, Property and Equipment at cost - - - - -	\$422,082,588	\$393,827,610
Rights, Franchises, Contracts, Goodwill, etc. - - - - -	1	1
Investments in and advances to subsidiaries not consolidated:		
Investments in securities at cost - - - - -	14,268,993	14,266,918
Advances - - - - -	21,387,000	19,696,954
	<u>\$457,738,582</u>	<u>\$427,791,483</u>
Prepaid Expenses and Sundry Assets:		
Sundry prepaid expenses, deferred charges, etc. - - - - -	\$ 2,366,377	\$ 2,064,704
Cash on deposit with trustee for sinking fund - - - - -	109,504	102,744
Investments in shares representing minority interests in other companies, at cost - - - - -	3,258,547	3,258,547
Guarantee deposits and sundry assets - - - - -	1,490,419	487,513
	<u>\$ 7,224,847</u>	<u>\$ 5,913,508</u>
Current Assets:		
Cash (including Brazilian currency) in banks and on hand	\$ 10,522,289	\$ 10,973,406
Temporary investments in securities of the Dominion of Canada at cost and accrued interest (market value \$5,526,586) - - - - -	5,524,786	8,531,791
Consumers' deposits lodged with government banks - - -	4,207,068	3,547,935
Accounts receivable less reserve - - - - -	13,200,947	8,799,468
Stores on hand and in transit as determined and certified by the management and valued at not more than cost - - -	17,969,516	20,883,095
	<u>\$ 51,424,606</u>	<u>\$ 52,735,695</u>

NOTES—

- (1) The above consolidated balance sheet and the attached consolidated statements of profit and loss and earned surplus are expressed in terms of United States currency.
- (2) The current assets and liabilities of the operating companies in Brazil were valued at the closing sight rate for exchange on New York.
- (3) The current assets and liabilities in Canadian dollars and in sterling were valued at the official rates for United States dollars.
- (4) The transfer of cash balances is subject to the exchange regulations of Brazil, Canada and the United Kingdom as the case may be.
- (5) The funded debt expressed in sterling has been converted at U.S. \$4.86 $\frac{2}{3}$ to the £.
- (6) Under arrangements completed since 31st December, 1948, International Bank for Reconstruction and Development has agreed to lend the Company up to \$75,000,000, or its equivalent in currencies other than cruzeiros, to finance costs arising under the current hydro-electric and telephone expansion programmes. Total commitments outstanding for construction, equipment, etc., at 31st December, 1948, were approximately \$18,000,000.

\$516,388,035

\$486,440,686

CONSOLIDATED BALANCE SHEET

AS AT 31st DECEMBER 1948

(WITH COMPARATIVE FIGURES AS AT 31st DECEMBER 1947)

LIABILITIES

	31st December 1948	31st December 1947
Capital:		
Authorized—		
3,934 6% cumulative convertible preference shares of a par value of \$100 each.		
7,920,220 ordinary shares of no par value subject to increase up to a total of 7,933,333 shares of no par value by conversion of preference shares.		
Issued and outstanding—		
3,934 preference shares - - - - -	\$ 393,400	\$ 393,400
7,029,893 ordinary shares - - - - -	179,358,230	179,358,230
Earned Surplus - - - - -	80,502,535	67,494,178
	<u>\$260,254,165</u>	<u>\$247,245,808</u>
Shares of Subsidiaries in Hands of Public - - - - -	\$ 1,684,193	\$ 1,684,193
Funded Debt:		
The Rio de Janeiro Tramway, Light and Power Company, Limited 5% 50 year mortgage bonds (1st April, 1958)—		
balance after sinking fund redemptions (£1,833,428) - -	\$ 8,922,683	\$ 9,797,101
5% 22 year bonds (1st October, 1950) (£271,349) - -	1,320,563	1,320,493
The São Paulo Tramway, Light and Power Company, Limited 5% perpetual consolidated debenture stock (£821,917) - - - - -	3,999,996	3,999,996
São Paulo Electric Company, Limited—		
5% 50 year first mortgage bonds (1st January, 1962)—	4,121,093	4,454,947
balance after sinking fund redemptions (£846,800) - -	<u>\$ 18,364,335</u>	<u>\$ 19,572,537</u>
Reserves and Provisions:		
Provision for depreciation (including depreciation of physi- cal assets of subsidiaries not consolidated) - - - - -	\$111,157,847	\$105,110,941
Provision for amortization (including sinking fund reserves)	48,571,296	46,356,565
General reserves - - - - -	12,439,483	12,162,814
Provision for contingencies - - - - -	22,687,881	19,837,745
	<u>\$194,856,507</u>	<u>\$183,468,065</u>
Current Liabilities:		
Accounts payable and accrued charges - - - - -	\$ 31,662,795	\$ 22,804,796
Consumers' deposits (per contra) - - - - -	4,207,068	3,547,935
Liability for 5% 50 year mortgage bonds of The Rio de Janeiro Tramway, Light and Power Company, Limited, drawn for redemption in 1949 - - - - -	331,894	707,278
Sharewarrant and bond coupons payable, dividend cheques outstanding and accrued interest on funded debt - -	5,027,078	7,410,074
	<u>\$ 41,228,835</u>	<u>\$ 34,470,083</u>
	<u>\$516,388,035</u>	<u>\$486,440,686</u>

On behalf of the Board:

HENRY BORDEN, {
E. C. Fox, { Directors.

BRAZILIAN TRACTION, LIGHT AND POWER COMPANY, LIMITED
AND SUBSIDIARY COMPANIES

STATEMENT OF CONSOLIDATED PROFIT AND LOSS

FOR THE YEAR ENDED 31ST DECEMBER, 1948
(With comparative figures for the year ended 31st December, 1947)

	Year ended 31st December 1948	Year ended 31st December 1947
Gross earnings from operations - - - - -	\$101,945,202	\$92,578,431
Interest on temporary investments - - - - -	121,541	359,489
Other miscellaneous income - - - - -	111,824	144,388
Total revenue - - - - -	<u>\$102,178,567</u>	<u>\$93,082,308</u>
Less:		
Operating expenses including provision for taxes - - - - -	\$ 63,754,132	\$57,097,476
Provision for depreciation - - - - -	8,136,196	6,601,311
Provision for amortization - - - - -	1,000,000	1,000,000
Total operating expenses, depreciation and amortization - - - - -	<u>\$ 72,890,328</u>	<u>\$64,698,787</u>
Net profit before bond interest, sinking funds and other financial charges - - - - -	<u>\$ 29,288,239</u>	<u>\$28,383,521</u>
Less:		
Bond interest - - - - -	\$ 1,262,229	\$ 1,435,429
Sinking funds and other financial charges - - - - -	939,768	966,708
Total interest and other financial charges - - - - -	<u>\$ 2,201,997</u>	<u>\$ 2,402,137</u>
Net Profit for the year - - - - -	<u>\$ 27,086,242</u>	<u>\$25,981,384</u>

NOTE—Remuneration of directors (excluding executive officers) including payments by subsidiary companies amounted in 1948 to \$13,920.

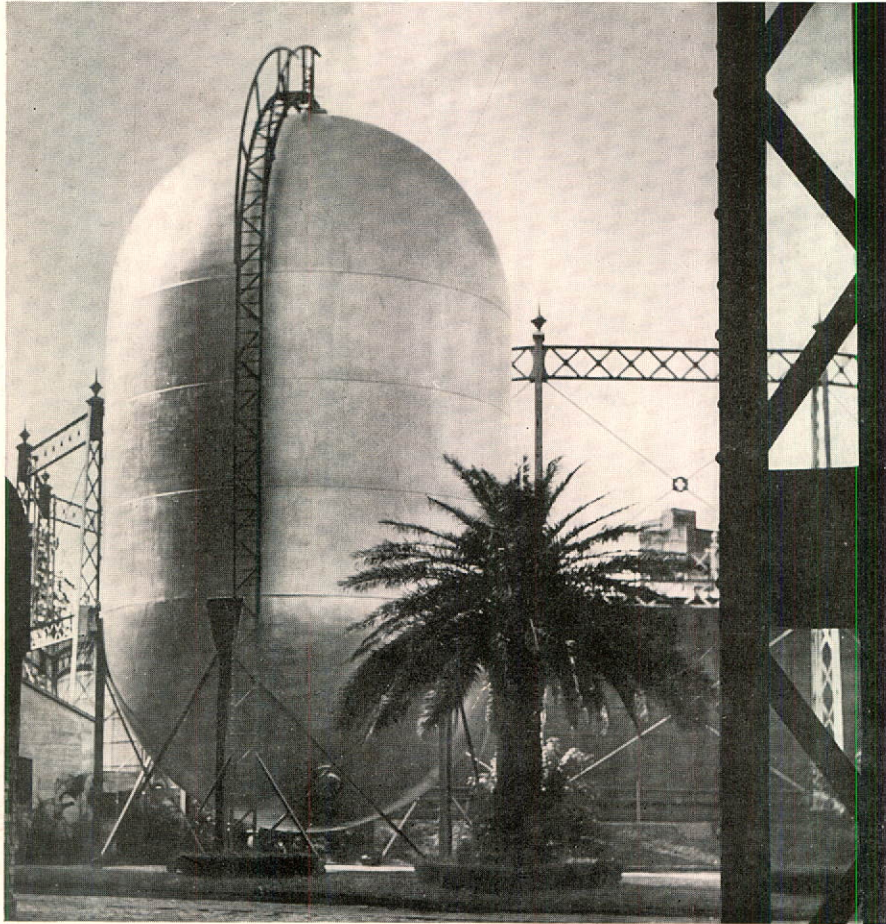
Remuneration of counsel, solicitors and legal advisers and executive officers including payments by subsidiary companies amounted in 1948 to \$663,456.

STATEMENT OF CONSOLIDATED EARNED SURPLUS

FOR THE YEAR ENDED 31ST DECEMBER, 1948

Balance 31st December, 1947 - - - - -	\$67,494,178
Net profit for the year ended 31st December, 1948 - - - - -	27,086,242
	<u>\$94,580,420</u>
Less dividends:	
Preference shares—	
\$6.00 per share - - - - -	\$ 23,604
Ordinary Shares—	
\$1.00 per share paid 2nd June, 1948 - - - - -	\$7,027,105
\$1.00 per share paid 15th December, 1948 - - - - -	7,027,176
	<u>14,054,281</u>
Balance 31st December, 1948 - - - - -	<u>\$80,502,535</u>





TYPICAL HIGH PRESSURE GAS HOLDER, 3000 CUBIC METRE CAPACITY, SÃO PAULO